Listing of the Claims

1. (previously presented) A method for preventing photo-induced chemical attack on a copper oxide containing surface comprising the steps of:

providing a substrate comprising a dielectric material and an exposed copper containing surface comprising copper oxide;

providing an acidic cleaning solution for contacting the exposed copper containing surface; and,

shielding the exposed copper containing surface to substantially block incident light from impacting the exposed copper containing surface while contacting the exposed copper containing surface with the acidic cleaning solution.

2. (previously presented) The method of claim 1, wherein the substrate further comprises a semiconductor wafer and the copper containing surface comprises copper filled metal interconnects.

3. (previously presented) The method of claim 1, wherein the incident light has a wavelength of between about 300 nanometers and about 800 nanometers.

4. (original) The method of claim 1, wherein the acidic cleaning solution has a pH of between about 3.0 to about 4.5

5. (original) The method of claim 2, wherein the step of shielding is performed during a post-CMP cleaning process.

6. (previously presented) The method of claim 5, wherein the post-CMP cleaning process comprises contacting the substrate with the cleaning solution according to at least one of a dipping process, a brushing process, and megasonic cleaning process.

7. (original) The method of claim 6, wherein the post CMP cleaning process is automated for processing a substrate through a plurality of cleaning stations.

8. (previously presented) The method of claim 1, wherein the step of shielding comprises placing a light blocking means between the incident light and the copper containing surface.

9. (previously presented) The method of claim 7 wherein the step of shielding comprises placing a light blocking means to at least partially surround each of the plurality of cleaning stations.

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10. (previously presented) A method for preventing photo-induced chemical attack of a cleaning solution on a copper containing surface comprising the steps of:

providing a copper containing surface comprising a dielectric layer formed on a semiconductor wafer;

performing a copper CMP process;

providing an acidic cleaning solution for cleaning the copper containing surface; and,

shielding the cleaning solution and the copper containing surface to substantially block incident light while cleaning the copper containing surface with the acidic cleaning solution in a cleaning process.

11. (previously presented) The method of claim 10, wherein the copper containing surface comprises copper filled metal interconnects.

12. (original) The method of claim 10, wherein the incident light has a wavelength of between about 300 nanometers and about 800 nanometers.

13. (cancelled)

14. (previously presented) The method of claim 10, wherein the acidic cleaning solution has a pH of between about 3.0 to about 4.5.

15. (cancelled)

16. (previously presented) The method of claim 10, wherein the cleaning process comprises contacting the copper containing surface with the acidic cleaning solution according to at least one of a dipping process, a brushing process, and a megasonic cleaning process.

17. (previously presented) The method of claim 16, wherein the cleaning process comprises an automated process for processing the substrate at a plurality of cleaning stations.

18. (previously presented) The method of claim 16, wherein the step of shielding comprises placing a light blocking means between the incident light and the cleaning process.

19. (previously presented) The method of claim 18, wherein placing a light blocking means comprises placing a light blocking means to at least partially surround the cleaning process.

20. (previously presented) The method of claim 17 wherein the step of shielding comprises placing a light blocking means to at least partially surround each of the plurality of cleaning stations.

21. (previously presented) The method of claim 10, wherein the copper containing surface comprises copper oxide.